

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-38. (Canceled)

39.(New) A sputtering apparatus for manufacturing a photo mask blank having a substrate and a film coated thereon, comprising:

a vacuum tank;

a magnetron cathode to which a sputtering target is attached so that a surface of the target is directed downwards with respect to a gravity direction;

a substrate holder to hold the substrate so that a surface of the substrate is directed upward,

and

a shield which is detachably disposed in the vacuum tank for preventing sputtering film from attaching to an inner wall of the vacuum tank,

wherein said shield has a shape so that a sputtering film formation rate for a position on the shield is not larger than a film formation rate for a position on the substrate, and

wherein the shield has a rounded shape with no corner.

40.(New) The apparatus of Claim 39 wherein a relative film formation rate value t according to the formula (i) for a position on the shield is not larger than the value for a position on the substrate;

$$t = \cos\theta_1 \times \sin(\theta_1 - \theta_2) / r^2 \quad (i)$$

whereby r denotes a distance between a center of the target and the position,

θ_1 denotes an angle of a line connecting the center of the target to the position with respect to a normal of the target plane,

θ_2 denotes an angle of a plane on which the position is located with respect to the normal of the target plane, and

t denotes the relative film formation rate for the position defined by r and θ_1

41.(New) The apparatus of Claim 40 wherein the shield is electrically grounded.

42.(New) The apparatus of Claim 41 wherein a temperature of the shield is controlled to be constant.

43.(New) The apparatus of Claim 41 wherein the shield has a surface which is roughened.

44.(New) The apparatus of Claim 41 which further comprises a target shield for shielding a part of the target which is not subjected to sputtering.

45.(New) The apparatus of Claim 41 which further comprises a backing plate to support the target, the backing plate having a roughened surface.

46.(New) The apparatus of Claim 45 which further comprises a shield plate for preventing the film formation on a peripheral portion of the substrate.

47.(New) The apparatus of Claim 46 wherein the shield plate is capable of shielding the

peripheral portion of the substrate with a clearance between the shield plate and the substrate.

48.(New) The apparatus of Claim 43 wherein an end of the shield extends to a position above the target surface to be sputtered.

49.(New) The apparatus of Claim 41 wherein the magnetron cathode is a whole-surface erosion cathode.